

SPOKEN PERSUASIVE DISCOURSE OF ADULTS

WITH TRAUMATIC BRAIN INJURY (TBI)

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Speech-Language Therapy in the Department of Communication Disorders

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ABSTRACT

The purpose of this study was to evaluate the performance of adults with traumatic brain injury (TBI) on a spoken persuasive discourse task and to evaluate the affects of eliciting this language sample. Ten adults with TBI (mean age = 51 years and 5 months) and ten adults matched by age and gender completed two spoken language tasks. These tasks required them to verbally provide their opinion of whether trained animals in circuses should be allowed to perform for the public and also whether public transport should be encouraged for everyone to use. One of the tasks was provided with examples for and against the topic within the instructions whereas the other task instructions provided no examples. The presentation of these tasks was alternated within the groups so as not to assist with task practice. Language measures included productivity (total number of words, mean length of T-units, T-units per minute and percentage of T-units with mazes) and complexity (total number of clauses, clause density and clause type). Pragmatic measures included the essential features of argument as identified in the developmental literature (number of claims, reasons, elaborations, repetitions, irrelevancies, and presence of an introduction and conclusion). The TBI group produced more total clauses and independent clauses for the language complexity measures compared to their age-matched peers, and used significantly more adverbial clauses. On comparison of the elicitation technique, the instructions with examples elicited a significantly greater number of reasons than that of the basic instructions. The results are discussed alongside current literature in the field of discourse production and persuasion. Implications for clinical practice and future directions for research in this area are also suggested.

CHAPTER 1

LITERATURE REVIEW

1.0 Introduction

Traumatic brain injury (TBI) refers to an injury to the brain due to an external factor, for example, motion (e.g. contra coup movement) or an object making contact with the head. It was estimated in 2006 that for the New Zealand population at that time of four million people the number of young adult and adult patients seen by medical practitioners was approximately 700 per 100,000 patients per year (New Zealand Guidelines Group [NZGG] & Accident Compensation Corporation [ACC], 2006). This indicates that there are a significant number of people living with the effects of TBI in New Zealand and that this is an on-going issue.

In addition to these newly acquired brain injuries in adulthood, individuals who have sustained a TBI in their youth are likely to have residual difficulties that pervade throughout their adult years (Catroppa & Anderson, 2004; Chapman, 1997; Ewing-Cobbs, Brookshire, Scott & Fletcher, 1998).

TBI leads to many life-changing difficulties including that of communication and language. One area of language that has been shown to be affected following TBI is discourse production (Biddle, McCabe & Bliss, 1996; Ewing-Cobbs et al., 1998; Hartley, 1995; Hay & Moran, 2005; King, Hough, Walker, Rastatter, & Holbert, 2006; Snow, Douglas & Ponsford, 1995, 1997). Discourse refers to language production beyond the sentence level and can be produced in both written and spoken forms (Grosz & Sidner, 1986).

One area of discourse that is of particular interest following TBI is persuasive discourse. Persuasion is a complex and essential skill which continues to develop into early adulthood (Clark & Delia, 1976; Nippold, Ward-Lonergan & Fanning, 2005). An adult would find themselves regularly utilising persuasive discourse skills within day-to-day activities. For example adults may spend time, providing reasons for their desired holiday destination, convincing their partner to watch a particular TV programme, and providing their opinion during team discussions within their place of employment.

To date there is a paucity of research in the area of persuasive discourse in adults with TBI. This study has been designed to explore persuasive discourse production and to explore factors that may affect production. Specifically, there are two primary aims for this research:

1. To evaluate the spoken persuasive discourse abilities of adults with TBI compared with age and gender matched peers who have not sustained a TBI.
2. To investigate the affect of using examples with instructions on persuasive discourse performance in both TBI and non-TBI populations.

1.1 Language Following TBI

Individuals who suffer from a TBI present with a number of language difficulties such as vocabulary choice, grammar, sentential complexity, fluency and dysarthria (Biddle et al., 1996; Chapman, 1997; Ewing-Cobbs et al., 1998; Hartley, 1995; Hay & Moran, 2005; King et al., 2006; McKinlay, Brooks, Bond, Martinage, & Marshall, 1981; Snow et al., 1995, 1997; Wiegel-Crump & Dennis, 1986). Cognitive processing difficulties may be additional issues that underpin the more salient language difficulties, for example, difficulties with attention, storage and retrieval of vocabulary and content, and working memory (Chapman, Watkins, Gustafson, Moore, Levin & Kufera, 1997; Hartley, 1995; King et al., 2006; Tompkins, Bloise, Timko & Baumgaertner, 1994). Chapman (1997) identified the cognitive-communication needs of those who have sustained a TBI as being different from those with developmental language impairments, indicating the complexity of difficulties and the need to manage these differently than with typical assessment and management criteria. The degree and presentation of these difficulties will manifest differently for each individual who has suffered a TBI dependent on the type and severity of the injury (Blake, 2007; Hartley, 1995), however the presentation of these factors often negatively impact on successful communication with others.

Although there are numerous ways that language can present following TBI, one area that is affected is discourse production. Discourse production is an area that may be sensitive to impairment following TBI as it is an integration of a number of linguistic and cognitive skills. For instance, in order to produce discourse, a speaker needs to use appropriate syntax, words, framework, remember what has been said, and to consider what the speaker already knows. Chapman (1997) suggested that the paucity of research in the

area of discourse is due to the lack of systematic procedures for characterising discourse, however of late due to the increased awareness in this aspect more research has begun to delve deeper into the features of discourse.

Discourse production has been of interest to many investigators concerned with language following TBI (Biddle et al., 1996; Cannizzaro & Coelho, 2002; Cook, 2008; Davies, 2008; Gillam & Johnston, 1992; Hay & Moran, 2005; King et al., 2006; Snow et al., 1995, 1997), and a variety of genres being researched including narrative (e.g. Chapman, 1997; Biddle et al., 1996; Coelho, 2002; Ewing-Cobbs et al., 1998; Gillam & Johnston, 1992) and expository (e.g. Hay & Moran, 2005; Snow et al., 1995, 1997). One form of discourse that has received relatively little attention however, is persuasive discourse.

1.2 Persuasive Discourse

Persuasive (or 'argumentative') discourse attempts to convince a listener of something (Paul, 2001). Persuasive discourse is of interest for many reasons. First, it is a highly utilized form of discourse in social and work situations. For example, it is not uncommon for individuals to have to persuade others to see their point of view. Although written persuasion tends to be used in more formal settings such as formal exams, or letters to newspapers, spoken persuasion is used almost daily in social interactions. Second, persuasive discourse is a fairly complex form of discourse that could be particularly challenging for individuals with TBI.

Studies of development and use of persuasion have revealed that persuasion is a sophisticated skill that develops over time (e.g. Felton, 2004; Makau, 1990; Nippold, 1994). Makau (1990) identified that many strategies are employed when persuading others, which may include: emotional appeals, manipulative strategies, logical explanations, truthful

statements. In order to successfully utilise these persuasive strategies in spoken form, the speaker must adjust their style according to interpersonal and situational factors (Nippold, 1994). For example, an adult may provide facts and examples to influence another's decision towards purchasing an item, whereas a child may simply state "I want that". Likewise, developmental studies have shown that by adulthood, sophisticated strategies are in place that may be challenging for individuals with TBI. For instance, by adulthood individuals would be expected to present diversity of thought and a large number of reasons to support claims (Nippold et al., 2005).

Similarly, adults should be able to adjust to listener characteristics; anticipate and reply to counterarguments; generate a greater number and variety of different arguments; demonstrate better ability to control the interaction (Nippold, 1994). Finally, the tendency to take on other perspectives increases when involved in persuasive discourse. These skills are different from those required in narrative or expository for instance, where the listener is not expected to change his/her mind and the listener's attitudes are not having to be considered. Given the cognitive and linguistic sophistication required, it is expected that individuals with TBI would show difficulties in persuasive discourse production.

1.3 Persuasive Discourse Following TBI

Relatively little is known about persuasive discourse following TBI. However there have been a number of studies that have looked at other genres such as narrative and expository discourse. These studies have revealed that individuals with TBI tend to show reduced production of content (Chapman et al., 1997; Hay & Moran, 2005), fewer and shorter utterances (Chapman et al, 1997; Ewing-Cobbs et al., 1998; Hay & Moran, 2005), and reduced lexical diversity (Ewing-Cobbs et al., 1998). Difference across fluency, rate, and

syntax were less common. For instance, Ewing-Cobb et al. (1998) found that when assessing narrative discourse in children with TBI that the differences between groups were noticeable for lexical and sentential features as opposed to fluency, rate or maze variables. TBI children performed more poorly than their typically developing peers producing less total number of utterances, fewer words, and lower type-token ratio. Their discourse samples were characterised by reduced lexical diversity.

Hay & Moran (2005) compared the discourse production of children with TBI to typically developing peers on both narrative and expository discourse formulation tasks. The TBI group differed significantly on both tasks across language and information domains in addition to their difficulties of formulating a moral or an aim. Specifically, the individuals with TBI produced discourse samples with fewer words and T-units, demonstrated reduced sentential complexity, and produced significantly fewer propositions, episodic structure and global story components. The results coincided with the findings from Chapman et al. (1997) that identified that children with TBI performed more poorly on the information domain of their discourse samples with narrative tasks. Unlike Chapman et al. (1997), Hay & Moran (2005) found that the children with TBI also performed poorly with language measures. Interestingly in Hay & Moran (2005) the TBI group performed more successfully with the narrative task compared to that of the expository task. This aligns with results from Scott & Windsor (2000) study which identified expository discourse samples as shorter, less fluent, more complex and more error prone than the genre of narrative.

Using these findings as a basis for predicting persuasive discourse abilities following TBI, it would be expected that individuals with TBI would produce shorter persuasive discourse samples with fewer arguments and possibly reduced vocabulary.

Although little has been done in spoken persuasion, Davies (2008) examined the skills of written persuasive discourse in adolescents with TBI. It was noted that participants with TBI performed more poorly with pragmatic measures (e.g. number of reasons provided to support the claim, repetitions of information and attitude), however surprisingly found no significant difference on language measures of productivity and complexity.

With respect to spoken persuasion, one study that examined retelling of spoken discourse is that of Cook (2008). Cook (2008) compared retellings of persuasive and narrative discourse passages in adults with TBI. Significant differences were noted in the language domain (i.e. productivity and sentential complexity), as well as information domain (e.g. how many reasons or episodes) and in the ability to generate a moral or aim. The subtle differences in results between Cook's (2008) study and Davies' (2008) research may have been related to the modality that was used (written versus spoken) and the type of task elicited (generation versus retelling). It has been shown that differences in task can affect output even across similar genres (e.g. Cook, 2008; Felton, 2004; Ferretti, MacArthur & Dowdy, 2000; Hay & Moran, 2005; Scott & Windsor, 2000). For persuasive discourse, it is worth considering what factors may influence output, particularly with elicitation techniques.

1.3.1 Elicitation Persuasive Discourse

A number of factors have been identified as potentially influencing persuasive discourse production including topic and elicitation task. For instance, for persuasive discourse topic interest and familiarity would likely influence production. Nippold et al. (2005) noted participants were willing to express their views openly due to the topic being of interest to them. Nippold (1994) queried whether a desirable topic led to greater persuasive

effort, and suggested that researchers should consider the importance of topic to research participants when utilizing specific scenarios. Likewise, a large variety of elicitation techniques have been used with little known about the effectiveness or differences of each. For instance, role playing (Paul, 2001), dialogue with a person with an opposing view (Felton, 2004), retelling persuasive discourse provided from audiotape (Cook, 2008), providing a topic (verbally and in written form) and asking for a written form of their opinion with specific examples of opinions for and against the topic (Davies, 2008; Nippold et al., 2005), and using a shared web-page (Nussbaum, 2005), are all examples of elicitation techniques yet little is known about the influence of these types of task. There has been some research however, into how instructions to participants affect discourse production in non-brain injured populations.

Ferretti et al. (2000) measured the effect of providing elaborated goal direction within a persuasive letter writing task in school aged students (10 – 12 years of age). Elaborated instruction referred to providing specific directions to the participant of what they should provide within their response i.e. to produce an opinion, with 2 – 3 reasons for the opinion, examples to support the reasons, 2 – 3 reasons why others might not agree and why those reasons are incorrect. Findings indicated that this direction within the instructions assisted the older students with their writing, resulting in a greater level of persuasion and a greater level of argument elements. However, this direction did not improve the persuasive writing of the younger participants. This supports Felton's (2004) suggestion that persuasive skills develop along a trajectory as an individual progresses towards adulthood. The elaborated goal technique was later employed in Nippold et al. (2005) and Davies (2008) studies, in the form of providing examples of opinions for and against a controversy and reasons for these,

in order to demonstrate what the researchers were expecting from the participants when providing their own opinion towards the controversy.

1.3.2 *Elicitation Persuasive Discourse: TBI*

Elicitation techniques will likely play an important role in aiding or inhibiting specific outputs. Davies (2008) utilised the elicitation technique that Nippold et al. (2005) had earlier employed when assessing persuasive skills in typically developing children, adolescents and adults. This technique involved providing participants with written instructions with examples within the instructions, in addition to a visual montage of related pictures i.e. examples and pictures associated with animals in circuses. With this task the TBI group performed more poorly with pragmatic measures, specifically, they produced significantly fewer reasons to support their claims, and had significantly more repetitions of information. They also failed to demonstrate alternative perspectives on the topic. However, there were no significant differences on measures of language productivity or complexity, although they did perform consistently lower than that of their peers on these measures.

Anecdotally, individuals with TBI benefit from being provided with specific examples to assist with their understanding of instructions and expectations. In addition to this anecdotal evidence, individuals with TBI often demonstrate repetition of information and perseveration of ideas (Bernard, McGrath & Houston, 1996; Davies, 2008). It would be useful to further investigate the use of providing instructions with examples within the TBI population and whether this directs the way in which they construct their argument. This would lead to further clinical implications as to the benefit (e.g. assisting with expectations) or the negative affect (e.g. directing ideas, repetition of the same examples and restricting initiation of their own ideas) of providing examples.

1.4 Summary and Thesis Aims

For the purpose of this study, Nippold et al.'s (2005) elicitation technique will be employed to generate spoken persuasive discourse in both populations. A second technique of providing two types of instructions 1) general/non-explicit instructions and 2) elaborated instructions with examples for and against the topic, will also be used. This will provide information with regards to whether the use of examples assist or have no affect on production of persuasive discourse in both populations of adults with and without TBI.

Specifically, the questions to be addressed are:

1. To evaluate the spoken persuasive discourse abilities of adults with TBI compared with age and gender-matched peers who have not sustained a TBI.
2. To investigate the affect of using examples with instructions on persuasive discourse performance in both TBI and non-TBI populations.

CHAPTER 2

METHOD

2.1 Participants

A total of 20 participants participated in the study. Ten adults with Traumatic Brain Injury (TBI) and 10 age and gender matched individuals who had not sustained a TBI (non-TBI comparison group). Participant ages ranged in age from 40 years to 64 years (*mean age* = 51;5) and consisted of 8 males and 12 females. For the individuals with TBI, participants were recruited through advertisements placed in the Traumatic Brain Injury Society newsletter and via word of mouth. Participants were considered to be brain damaged if they had current claims accepted by the Accident Compensation Corporation of New Zealand (ACC) for difficulties that resulted from an accidental brain injury. This was verified by a neurosurgeon. Onset of injury had taken place no earlier than one year from the start date of the study. This was to ensure results were not influenced by spontaneous recovery. Participants were excluded from the study if: a) English was not the primary language spoken in activities of daily living; b) any co-existing injuries were present that may have a significant impact on results (e.g. cardio-vascular accident, prior language disorder). The TBI group differed across age, sex, ethnicity, nature of accident and severity of injury. Severity levels of injuries were not available for all the individuals in the TBI group, due to the lengthy time between time of injury and this investigation; however all TBI participants reported having difficulties with communicating. The participants also ranged across socio-economic status as determined by their reported occupations currently and prior to the injury. Participant demographics for individuals with TBI are reported in Table 1.

Table 1: Participant Demographics

Participant	Gender	Age at injury	Age at testing	
			TBI	C
1	M	58;3	63;11	64;1
2	F	26;9	47;10	47;2
3	F	57;5	58;9	61;7
4	M	21;6	46;2	45;2
5	F	40;1	48;7	48;1
6	M	28;0	44;1	41;3
7	M	38;3	40;5	39;1
8	F	52;6	58;9	55;10
9	F	22;3	55;5	50;9
10	F	47;4	55;9	56;6

Note. M = Male, F = Female; Age = years;months

The non-brain injured participants were recruited to match the adults with brain injury based on gender and age (± 5 years) and where possible socioeconomic status. This was done to reduce the possible significance of socioeconomic status on areas of discourse production, as noted by Coelho (2002) and others (Snow et al., 1995, 1997; Yorkston, Zeeches, Farrier & Uomoto, 1993). Typically developing adults were recruited via word of mouth. They reported no known language difficulties or having sustained a head injury that required ACC funding. All participants, with or without a TBI, spoke English as a first language. No known neurological or developmental deficits were reported by the participants. Participants with significant hearing difficulties were excluded from this study.

2.2 Procedures

Participants were seen individually at their choice of venue: at their home; at their place of work (if appropriate); or at the University of Canterbury Department of Communication Disorders Speech & Hearing Clinic. Ten participants chose to be seen at their homes, with eight participants coming into the University Clinic and two opting for participating at their place of work. Two participants chose to have a support person present with them in the room during the session. All sessions were conducted in rooms that were quiet and where there were minimal distractions. All tasks were administered by the principal researcher.

The testing sessions were made up of the experimental discourse tasks as well as ancillary testing which included a standardized expressive and receptive language task and

a working memory task. All sessions were recorded on a Sony Hi-MD Audio Portable Minidisk Recorder (MZ-NH1) using a Sony Electret Condenser Microphone (ECM-MS907).

All sessions were similar in their format, however the order of persuasive discourse tasks were counter-balanced within both groups. A brief introduction and explanation of the session and signing of the consent form (as per the information sheet and consent form they had previously received, see Appendix A) occurred at the start of the session. Ancillary testing was conducted prior to administration of the experimental persuasive discourse tasks. The session duration was between an hour to an hour and a half for participants with TBI, and between 45 minutes to an hour for non-TBI participants. Participants were offered frequent breaks between tasks, and provided with the option of completing the tasks over two sessions to assist with minimising fatigue levels.

2.2.1 *Ancillary Testing*

Prior to administering the persuasive discourse tasks two ancillary measures were taken:

- 1) a standardized expressive and receptive language measure (Clinical Evaluation of Language Fundamentals – 4) (Semel, Wiig & Secord, 2003).
- 2) a working memory measure (Tompkins et al., 1994).

Clinical Evaluation of Language Fundamentals – 4 (CELF-4). The CELF-4 (Semel, et al., 2003) was made up of a range of expressive language, receptive language, memory, phonological awareness and pragmatic subtests. For the purpose of this study, subtests that provide information of overall language ability (core language score) were used (recalling sentences, formulated sentences, word classes and word definitions). These subtests assessed both

expressive and receptive language skills. Raw score values were obtained and converted into standard scores. The total of these scores for each participant were then translated into a core language score (see Table 2).

Working Memory Task (See Appendix B). The working memory task devised by Tompkins et al. (1994) was administered to each participant. This task was comprised of a processing element and a storage element. Participants were required to listen to groups of sentences presented on an audio-tape that increased in number from two to five sentences per group, with three groups being presented per level. Participants were instructed to answer true or false after each sentence (processing element) and then to recall the last word of each sentence after hearing the whole group of sentences (storage element). The number of correct true or false responses and the total number of words recalled were recorded. A working memory score was devised based on the percentage of the total number of words recalled (see Table 2).

Table 2: Performance of Participants on Ancillary Testing

Participant	CELF-4				Working Memory			
	CLS				% of total words			
					correct			
	TBI	C	T	p	TBI	C	t	p
			95.00	0.27			-0.963	0.349
1	87	120			57	88		
2	78	114			43	76		
3	64	99			71	69		
4	109	106			71	57		
5	121	100			98	71		
6	96	108			57	74		
7	118	109			90	90		
8	115	117			83	71		
9	106	117			57	81		
10	56	98			38	57		

Note. CELF-4 = Clinical Evaluation of Language Fundamentals - 4 (results shown are core language scores (CLS); A Core Language Score of between 85 and 115 is considered within normal limits.

All participants in the non-TBI group performed within normal limits on the CELF-4. Three of the ten participants with TBI scored below normal limits on the CELF-4. To compare group performance (TBI versus non-TBI comparison group) on the CELF-4, a Mann-Whitney Rank Sum Test was run. Results were not statistically significant between the two groups $T = 95.000$ ($p = 0.473$). Differences between the groups on the working memory task were also compared. A t-test for unequal variance was conducted to determine if there were any significant differences between the groups for the Working Memory task. The results were not statistically significant.

2.2.2 *Spoken Persuasive Discourse Tasks*

The procedures used were based on Nippold et al. (2005) study. Davies (2008) also used this method. Both studies were investigating written tasks, therefore the instructions used with this current study were modified to elicit spoken discourse samples. All participants were requested to provide their spoken opinion on two topics presented to them. The first topic was whether or not circuses with trained animals should be allowed to perform for the public (Nippold, 2005). The additional topic was whether or not public transport should be encouraged for everyone to use. These topics were chosen due to research indicating that people have strong opinions on animal welfare and environmental topics (Clark & Delia, 1976; Cullen, Hughey & Kerr, 2006). Each participant was presented

with a written version of the instructions while the examiner read the instructions out loud. The topic-specific instructions remained in front of the participant during the discourse task. Topics were presented one at a time and the presentation of topics was counter-balanced between participants to minimise the possibility of task practice affecting results. Nippold et al. (2005) and Davies (2008) provided a visual montage to correspond with the circus topic, however this aspect was not undertaken within this study. One topic was presented with general instructions (i.e. simply asking for the participant's opinion on a topic) and the other topic was presented with elaborated instructions. Specifically, three examples of reasons for and against were incorporated within the instructions therefore outlining possible opinions and demonstrating how opinions could be presented (see Appendix C). The instructions were read aloud by the examiner with a printed version placed in front of the participant.

Example of topics and elicitation tasks.

Topic 1, Task 1:

*People have different views on animals performing in circuses. For example, some people think it is a **great idea** because it provides lots of entertainment for the public. Also, it gives parents and children something to do together, and the people who train the animals can make some money. However, other people think having animals in circuses is a **bad idea** because the animals are often locked in small cages and are not fed well. They also believe it is cruel to force a dog, tiger, or elephant to perform certain tricks that might be dangerous. I am interested in learning what **you** think about this topic, and whether or not **you** think circuses with trained animals should be allowed to perform for the public. I would like you to spend the next few minutes to tell me in depth exactly what **you** think about this topic. Give me lots of good reasons for your opinion. Take your time to gather your thoughts and then you can start talking about this topic when you are ready. Do you have any questions?*

Topic 2, Task 2:

*People have different views on public transport, like buses or trains. I am interested in learning what **you** think about this topic, and whether or not **you** think public transport should be encouraged for everyone to use and your reasons why. I would like you to spend the next few minutes to tell me in depth exactly what **you** think about this topic. Give me lots of good reasons for your opinion. Take your time to gather your thoughts and then you can start talking about this topic when you are ready. Do you have any questions?*

Participants were asked if they had any questions at the end of the instruction. Any questions were answered prior to the participant presenting their opinion. Instructions, questions and discourse samples were all recorded on an audio-tape.

No time constraint was presented within the instructions, compared to Nippold et al. (2005) and Davies (2008) instructions for the written task, where participants were requested to write for 20 minutes with an announcement when they had 5 minutes to go. In this study participants were simply requested to present their opinion in depth. The researcher prompted for additional information (e.g. "anything else?") if the participant completed their sample without any concluding comments (e.g. "and that's all I have to say about that").

2.3 Analysis

Language sample recordings were transcribed into electronic format by the principal investigator. All of the participants' speech productions were retained and transcribed as best as possible. Language samples were divided into aspects of language productivity, language complexity and pragmatics.

2.3.1 *Language Productivity*

The electronic versions of the transcriptions were divided into T-Units by the principal investigator. A T-unit (terminable unit) is defined as an independent clause with any associated dependent clause (Foster-Cohen, 1999). Any mazes (which included false starts (e.g. um, ah), repetition of words, reordering or changing word choice, or 'empty vocabulary' (e.g. so yeah, you know) were not included within the calculation of the t-units and other productivity measures (Fagan, 1982). Time length (in minutes) of each audio-taped sample was also measured in order to enable comparisons between the two participant groups with regards to time taken to generate and present information. Timing of the language sample commenced after any questions or general expectation discussion had been completed, or immediately after the instructions were presented if no questions were asked.

A second investigator, blinded to participant allocation, reviewed 20% of the transcripts with regards to segmentation into T-Units for reliability purposes. 100% level of agreement was achieved. From the segmented transcripts, the principal investigator was able to calculate language productivity measures including: number of T-Units; total words; mean length of utterances in words; T-units per minute; and percentage of T-units with mazes (see Table 3). The second investigator analysed 20% of the transcripts for these language productivity measures. The level of agreement between the two investigators was (94%). Any disagreement was then resolved to 100%.

Table 3: Language Productivity Measures

Language: Productivity	Mean Length of T-Unit in Words <i>(Total Words / T-Units)</i>	MLTU-W
	Total Words	TW
	T-Units per minute	TU per min
	% T-units with mazes	%TU with mazes

2.3.2 Language Complexity

Upon completion of preparing the transcripts for language production analysis, each transcript was coded by the principal investigator in order to identify syntactic information. Syntactic information coded consisted of: production of independent clauses; clause density (number of independent clauses divided by the number of T-Units); and types of dependent clauses (nominal, adjectival and relative) (see Table 4).

The second investigator independently analysed 20% of the samples for reliability purposes using a coding chart and criteria guide devised by the principal researcher (see Appendix D). Agreement was achieved between investigators on (78%) of the syntactic measures. Any disagreement was then resolved to 100% agreement through discussion. Samples were double checked to ensure accuracy of coding and calculations.

Table 4: Language Complexity Measures

Language: Complexity	Total Number of Clauses	TC
	$(indep + dep)$	
	Clause Density	CD
	$(indep + dep/T\text{-Units})$	
	Clause Type	
	• Independent	IC
	• Relative	REL
	• Adverbial	ADV
	• Nominal	NOM

Note. Indep = Independent clause; Dep = Dependent

2.3.3 Pragmatics

Each spoken language sample was examined for pragmatic elements that are essential features of persuasive discourse (Felton, 2004; Ferretti et al., 2000; Nippold et al., 2005). Features included: claim; number of reasons; number of elaborations on reasons; conclusions; and attitudes. In addition to these measures content measure were identified i.e. the number of irrelevancies, number of repetitions of information, number of other statements that added to the attitude yet not directly related, and if they presented introductory statements (See Table 5). The principal investigator coded the samples

according to the devised coding chart and criteria (see Appendix D). The second investigator then analysed 20% of the samples for reliability purposes. The second investigator was trained regarding interpreting the coding chart and identifying the pragmatic elements. The following levels of agreement were reached: number of introductions (88%); number of claims (75%); number of reasons (75%); number of elaborations (75%); number of irrelevancies 100%; number of other (88%); number of conclusions summary 100%; number of conclusions ending 100%, number of repetitions (88%); and attitude 100%. Any disagreement was resolved through discussion until 100% agreement was reached for each element.

2.3.4 *Statistical Analysis*

Multiple Two Way Repeated Measure Analysis of Variance (2 x 2 ANOVA) were performed for all of the language and pragmatic measures with the exception of attitude. Scores for attitude were reported as a percentage and segmented into two categories of mixed attitude (i.e. expressed views for both sides of the argument) and one view attitude (i.e. only presented one side of the argument).

Table 5: *Pragmatic Measures*

Pragmatics	Introduction	INTRO
	Claim	C
	Number of Reasons	R
	Number of Elaborations	E
	Conclusion	
	Summary	CONC-SUM
	Ending	CONC-END
	Irrelevancies	IR
	Other	OTHER
	Repetitions	REP
	Attitude	FOR
		AGAINST
		MIXED

CHAPTER 3

RESULTS

This study compared language and pragmatic measures of adults with TBI and their age and gender matched peers on spoken persuasive discourse tasks. In addition this study examined the effect of the elicitation technique of providing examples within the instruction on persuasive discourse measures. The results showed that the groups differed significantly on language complexity measures with individuals with TBI producing more utterances overall however there were no significant differences between groups on language productivity measures or pragmatic measures (e.g. number of reasons). Differences were found in terms of pragmatics across both groups when different elicitation techniques were compared. Specifically, when the directions included examples, both individuals with TBI and individuals without TBI provided significantly more reasons than when the directions did not include examples.

3.1 Language Measures

Samples were analysed for language measures of productivity and complexity. A Two Way Repeated Measures Analysis of Variance (ANOVA) was conducted for all of the linguistic measures. There were no significant differences between the two groups on the productivity measures. However, contrary to expectations, there were significant differences in language complexity with individuals with TBI producing significantly more utterances

and more independent clauses. Tables 6 and 7 display the means, standard deviations, F and p values for the language productivity and complexity measures.

3.2.1 Language Productivity Measures

Samples were analysed for language productivity measures of total words, mean length of T-units in words, T-units per minute, and percentage of T-units with mazes. A series of Two Way Repeated Measures ANOVAs (One Factor Repetition) were conducted to determine if there were any differences on any of these measures between the groups and tasks. There were no differences between the groups or the tasks and no interaction affect. Language measures of productivity are reported in Table 1 for each group and task.

Table 6: Language Productivity Measures for TBI and age-matched peers across tasks (n=10)

	Mean		SD		F		p	
	TBI	C	TBI	C	Group	Task	Group	Task
Total Words					2.898	2.732	0.106	0.116
With e.g.	269.50	197.40	182.81	77.72				
Without e.g.	216.90	144.40	114.10	63.29				
MLTU-W					2.596	0.545	0.150	0.470
With e.g.	14.22	14.89	4.05	2.78				
Without e.g.	12.37	15.44	2.66	3.34				
TU per minute					0.391	0.089	0.540	0.769
With e.g.	7.60	9.07	2.58	3.56				
Without e.g.	8.50	6.92	3.09	1.13				

	Mean		SD		F		p	
	TBI	C	TBI	C	Group	Task	Group	Task
% TU with					0.531	1.799	0.476	0.196
mazes								
With e.g.	55.50	42.70	16.49	20.86				
Without e.g.	56.80	58.30	27.44	23.15				

Note. With e.g. = Instructions with examples; Without e.g. = instructions without examples; TBI = TBI participants; C = age-matched peers; MLTU-W = Mean Length of T-units in words; TU = T-units.

3.2.2 Language Complexity Measures

Samples were analysed for language complexity measures including total number of clauses, clause density, clause type (independent, relative, nominal and adverbial). A series of Two Way Repeated Measures ANOVAs (One Factor Repetition) were conducted to determine if there were any differences on any of these measures between the groups and tasks. It was revealed that there was a statistical difference between the participant groups for the total number of clauses used $F(1, 18) = 5.464, p = 0.031$; the number of independent clauses $F(1, 18) = 7.235, p = 0.015$ and the number of adverbial clauses $F(1, 18) = 7.968, p = 0.011$. There were no significant differences between tasks and no interaction affect. Table 2 displays the language measures of complexity for each group and task.

Table 7: Language Complexity Measures for TBI and age-matched peers across tasks (n=10)

	Mean		SD		F		p	
	TBI	C	TBI	C	Group	Task	Group	Task
Total Clauses					5.464	1.082	0.031*	0.312
With e.g.	28.10	22.90	13.69	8.48				
Without e.g.	27.60	16.50	11.89	7.91				
Clause					1.269	0.055	0.275	0.817
Density								
With e.g.	1.59	1.74	0.31	13.30				
Without e.g.	1.69	1.69	0.21	0.30				
Ind. Clauses					7.235	1.094	0.015*	0.309
With e.g.	18.40	13.30	10.78	4.95				
Without e.g.	16.80	9.70	8.19	4.32				

	Mean		SD		F		p	
	TBI	C	TBI	C	Group	Task	Group	Task
Rel. Clauses					1.101	0.201	0.308	0.659
With e.g.	1.20	2.40	1.69	2.55				
Without e.g.	1.50	1.60	1.65	1.35				
Adv. Clauses					7.968	0.050	0.011*	0.826
With e.g.	4.80	3.60	3.36	2.27				
Without e.g.	6.10	2.70	3.41	1.16				
Nom. Clauses					0.147	1.386	0.706	0.254
With e.g.	3.90	3.60	4.25	2.88				
Without e.g.	3.10	2.50	1.29	3.54				

* Statistically significant ($p < 0.05$)

Note. With e.g. = Instructions with examples; Without e.g. = instructions without examples; TBI = TBI participants; C = age-matched peers; Ind. = independent; Rel. = relative; Adv. = adverbial; Nom. = nominative.

Tukey tests indicated that the TBI participants outperformed the age matched peers on total number of clauses and number of independent clauses used. Tukey tests also showed that TBI participants used more of the earlier developing subordinate clauses of adverbial clauses (Nippold et al., 2005).

3.3 Pragmatic Measures

Samples were analysed for pragmatic measures including introductions, claims, reasons, elaborations, repetitions, irrelevancies, other (additional information not necessary to present their opinion e.g. *I have ridden an elephant*), conclusion summary and conclusion ending. A series of Two Way Repeated Measures ANOVAs (One Factor Repetition) were conducted to determine if there were any differences on any of these measures between groups and tasks. It was revealed that there was a statistical difference between the number of reasons for the two different tasks for both participant groups $F(1, 18) = 5.488, p = 0.031$. The task with examples included within the instruction yielded a greater number of reasons than the task without examples, for both of the participant groups. Pragmatic measures are presented in Table 3 for each group and task.

Table 8: *Pragmatic Measures for TBI and age-matched peers across tasks (n = 10)*

	Mean		SD		F		p	
	TBI	C	TBI	C	Group	Task	Group	Task
Introduction					0.545	0.720	0.470	0.407
With e.g.	0.20	0.30	0.42	0.48				
Without e.g.	0.30	0.00	0.48	0.00				
Claims					3.279	2.651	0.087	0.121
With e.g.	3.10	5.10	1.60	2.69				
Without e.g.	2.90	3.60	1.73	1.60				
Reasons					4.247	5.488	0.054	0.031*
With e.g.	4.20	3.10	2.25	1.91				
Without e.g.	3.20	1.60	1.55	1.78				
Elaborations					0.828	2.901	0.375	0.106
With e.g.	4.80	4.50	4.26	2.12				
Without e.g.	3.90	2.50	2.42	1.84				

	Mean		SD		F		p	
	TBI	C	TBI	C	Group	Task	Group	Task
Repetitions					1.281	1.800	0.273	0.196
With e.g.	1.70	1.40	1.49	1.78				
Without e.g.	1.30	0.70	0.67	0.82				
Irrelevancies					0.300	1.161	0.591	0.295
With e.g.	0.40	0.10	0.70	0.32				
Without e.g.	0.40	0.50	0.52	0.71				
Other					0.876	0.822	0.362	0.376
With e.g.	0.60	0.50	0.70	1.67				
Without e.g.	1.10	0.60	0.53	0.84				
Conc.-sum.					1.800	1.000	0.196	0.331
With e.g.	0.30	0.30	0.48	0.48				
Without e.g.	0.30	0.00	0.48	0.00				

	Mean		SD		F		p	
	TBI	C	TBI	C	Group	Task	Group	Task
Conc.- end.					0.281	0.643	0.602	0.433
With e.g.	0.30	0.10	0.67	0.32				
Without e.g.	0.30	0.30	0.48	0.48				

* Statistically significant ($p < 0.05$)

Note. Conc.-sum. = conclusion-summary; Conc.-end. = conclusion-ending.

A Tukey test revealed that the elicitation technique of providing examples within the instruction elicited more reasons compared to the general instruction task, which coincides with the findings of Ferretti et al. (2000) when using more specific elaborated instructions.

3.4 Non-Statistical Analysis

3.4.1 Reasons

Interestingly statistics show that TBI produced significantly more reasons than their age matched peers on the persuasive tasks. Using the reporting method used by Ferretti et al. (2000) that 50% of the TBI group used at least 3 reasons to support their opinion when they were presented with a model of using reasons within the instructions, compared to 70% of their age matched peers. Providing examples within the instructions did not impact the percentage of TBI participants that used at least 3 reasons.

3.4.2 *Attitude*

An adaptation of the reporting methods that Nippold et al. (2005) used was utilised to describe participant attitude. The current participant's attitudes were reported as numbers and percentages of participants with mixed opinion and with one opinion (either for or against) of whether circuses with trained animals should be allowed to perform for the public and whether public transport should be encouraged for everyone to use.

With regards to attitude presented by participants within their discourse sample and the correlation to elicitation technique it is worth noting that for both populations that when they were presented with examples within the instruction they were more likely to present a more holistic viewpoint. Both participant groups produced a mixed opinion on the topics for 60% of the samples when examples were presented within the instructions. There were no differences between the populations with this measure with the exception of age matched peers, who were more likely to give a one sided view point when presented with general instructions. The age matched peers adopted a one sided opinion for 70% of the general instruction tasks compared to 60% for the TBI participants. The numbers and percentages of participants in each group with mixed and one sided attitudes are reported in Table 4.

Table 9: Participant Attitude (*n* = 10 per group)

	Mixed attitude		One sided attitude	
	E.g.	Gen.	E.g.	Gen.
TBI	6 (60)	4 (40)	4 (40)	6 (60)
Age Matched Peers	6 (60)	4 (40)	3 (30)	7 (70)

Note. Results shown as number and percentage of participants with one or both attitudes.

It is interesting to note the difference in quality of some samples when presented with the two different elicitation techniques. See Appendix E for examples from the different participant groups for the different topics and both elicitation tasks.

3.5 Comparison to Normative Data

Comparison can be made with results from this current study to that of Nippold et al. (2005), from which it was modelled. When comparing the results of the adult groups in the current study (TBI group mean age = 51;5 [years; months], range 40;5 -63;11; and age matched peer group mean age = 50;6, range 39;1 - 64;1) with the results from the typically developing adults (mean age 24;10, range 19;2 - 43;5) described by Nippold et al. (2005) some differences of note existed. The adult TBI group and their age matched peers, using the same format of task that was employed within Nippold et al's. (2005) study, produced fewer number of reasons (mean = 2.9 and 3.6 respectively) compared with the typically developing

adult group in Nippold et al. (2005). Within Nippold et al. (2005) the adult group mean number of reasons score was 12.72.

A further difference was noted between these two studies with regards to total number of words. The adult group in Nippold et al. (2005) study produced a mean score of 262.85, however in this current study the non-TBI group produced mean scores for the task with examples of 197.4 and 144.4 without examples. The mean score for the TBI group with examples (mean = 269.5) aligned more closely to that of Nippold et al. (2005) typically developing group, however in this current study the mean value decreased when the instruction did not have examples (mean without examples = 216.9).

Results for MLTU-W for the non-TBI participants were very similar to that found in Nippold et al. (2005). Nippold et al. (2005) found that the mean score for their adult participants for MLTU-W was 15.85, and in this study the participants mean score was 14.89 (with examples) and 15.44 (without examples).

CHAPTER 4

DISCUSSION

The primary purpose for this study was to: (a) to evaluate the spoken persuasive discourse abilities of adults with TBI compared with age and gender matched peers who have not sustained a TBI and (b) investigate the affect of using examples within instructions on persuasive discourse performance in both TBI and non-TBI populations.

Adults with TBI were not found to differ significantly on language productivity or pragmatic measures, however contrary to expectations did perform significantly better than their age-matched peers on language complexity measures of number of independent clauses and number of total clauses. An important finding of this study is that the use of examples does facilitate more persuasive discourse samples in both TBI and non-TBI populations. These finding reflect some similarities and differences found in previous research undertaken in the area of discourse and TBI populations. Implications for clinical practice when working with adults with TBI are presented along with recommendation for future directions of research in persuasive discourse with this population.

4.1 Group Differences: Adults with TBI and Age-Matched Peers

4.1.1 *Language Outcomes*

An important finding of this study was that there were no significant differences between groups on measures of language productivity. However, the TBI group did for the majority produce shorter utterances compared with their peers. Despite using shorter utterances, the TBI group demonstrated a greater disparity of total words used. A number of TBI samples were produced with a far greater number of words used than that of their age-matched peers.

Previous studies have found that TBI populations do not always demonstrate significant differences on formalised assessment or certain analytical measures as one might expect based on their observational analysis (Davies, 2008; Snow et al., 1995, 1997). Similarly to these results, Davies (2008) also noted that participants with TBI unexpectedly demonstrated no significant difference on language measures. Despite this seeming to be a positive aspect for those with TBI this does not capture the anecdotal evidence or even the awareness of those with TBI as to their persuasive language skills.

An earlier study from Snow et al. (1997) also identified this phenomenon that participants with TBI group did not differ significantly from the control groups of orthopaedic patients on measures of content and productivity, however they did differ on these measures when compared to university students.

Unexpectedly the opposite was found with language complexity measures. The TBI population produced a greater number of total clauses and independent clauses. Participants with TBI also produced significantly more adverbial clauses than that of their

age-matched peers. On the other hand, despite there not being a significant difference noted, participants without TBI produced a greater number of relative clauses than the TBI group.

Nippold et al. (2005) identified adverbial clauses being the early form of subordinate clauses with typically developing adults presenting discourse with more advanced clauses of relative clauses than younger typically developing groups. This indicates that despite the participants using a greater number of total clauses that of these clauses the complexity of clauses used was actually less than that of the non-TBI group.

Despite the significant differences of the total number of clauses and number of independent clauses used between the groups, the measures used may not capture all of the elements demonstrated to determine the complexity of samples. For example, circumlocution (talking around a topic) is unable to be captured unless they are repeating ideas used or providing irrelevant and tangential information to get to the idea. In correlation with this the vocabulary choice of TBI participants may differ from that of their age-matched peers, for example less sophisticated terminology, which may be due to potential word retrieval problems resulting in circumlocution and therefore increased number of words used. King et al. (2006) reported that following traumatic brain injury word retrieval is often a common problem. Interestingly King et al. (2006) did not find that this characteristic of adult TBI participants translated significantly into the data gained in the discourse tasks.

A key factor to enhance ones skills at providing a fluent and more complex persuasive discourse sample is to successfully employ self-monitoring strategies. An individual with TBI may have little awareness as to the extent of their difficulties (Bogod,

Mateer & MacDonald, 2003; Kennedy, Yorkston & Rogers, 1995) and therefore not evaluate the complexity or persuasiveness of their sample.

4.1.2. *Pragmatic Outcomes*

Contrary to expectations there were no significant differences between the TBI group and their age-matched peers for pragmatic measures. This differs from previous research that indicated that in this domain the most notable discrepancy between populations was observed. Snow et al. (1997) noted that the TBI participant group differed significantly on comparison to two control groups (orthopaedic patients and university students) with regards to pragmatic measures. In concurrence to this, Davies (2008) indentified that adolescents with TBI performed more poorly with pragmatic measures i.e. fewer number of reasons provided to support the claim, greater number of repetitions of information and fewer episodes of demonstrating other's perspectives with a mixed attitude.

It was observed that some of the TBI participants demonstrated an awareness or understanding of a formula or script to help with formulation of a persuasive discourse, whereas it appeared that generally non-TBI participants considered their samples to be affective with less effort or planning. On some occasions, participants with TBI showed greater level of planning prior to presenting each utterance, however this was not significant.

It was observed that there was an apparent variation between groups with regards to the level of effort put into presenting their opinion. This may be a factor of the motivation behind participating, for example, those with TBI often commented that they wished to participate in as many research studies as possible in order to further assist those that are living with the affects of TBI. Participants without TBI did not have this invested interest.

Participants with a TBI also may be more familiar with formalized assessment tasks due to hospital and rehabilitation evaluative measures. In comparison, their age-matched peers may feel less comfortable at being evaluated and therefore wish to complete tasks more quickly.

Davies (2008) contemplated similar aspects, and suggested that discourse sampling simply attempts to assess the most typically occurring forms of language rather than participant specific factors, such as personality traits, previous knowledge on topics and motivation towards task. These are all factors that are difficult to control however information could be gleaned within a questionnaire or interview based task to provide further parameters to link data to.

4.2. Task Differences: Instructions With and Without Examples

4.2.1 Language Outcomes

Despite there being no significant difference between tasks on language productivity measures it is of interest to note that fluency, by measure of percentage of mazes per T-units, was somewhat affected by the elicitation technique. Discourse samples for both groups were less fluent when they were not presented with examples within the instruction.

Interestingly, the non-TBI group was affected more by this technique. Comparison of the difference of mean scores within groups and across the two tasks shows that the non-TBI group has a greater difference between the two tasks.

This aligns with findings from Biddle et al. (1996) who also noted that there were significant differences between children and adults with TBI on measures of fluency when

assessing narrative language skills which set them apart from their typically developing age matched peers.

Research has also been conducted in the area of discourse with regards to mazes and planning. Fagan (1982) reported that mazes could be interpreted as a factor of language planning and could be noted at specific grammatical points within utterances e.g. connecting ideas. With regards to the current findings, the use of more mazes when not presented with examples could be due to participants needing to spend more time planning as they have not been given examples to direct their ideas.

With regards to language complexity, there can be seen to be an increase in total clauses and independent clauses used when both participant groups were presented with instructions with examples. This suggests that the use of more detailed instructions assist to produce a more lengthy discourse sample, providing a model of what is expected. It appears that the non-TBI group was more sensitive to this change as the difference between their mean scores was greater than that of the TBI group.

This could indicate that the participants of the TBI group are somewhat less aware of the subtle differences of the instructions inferring the expectations of the task. Evidence suggests that individuals who have sustained brain injury are more successful with understanding stated information than implied information (Nicholas & Brookshire, 1995). Based on this observation, this could lend towards reinforcing communication and instruction strategies of others to employ more explicit instructions rather than inferential communication acts when interacting with people with TBI. This would be a useful strategy to be reinforced in employment, training and social situations.

4.2.2 *Pragmatic Outcomes*

There was significant difference between tasks for the pragmatic measure of reasons. Results showed that when participants were presented with instructions that contained examples, they produced discourse samples with a greater number of reasons, which in turn leads to a more persuasive discourse sample.

Ferretti et al. (2000) found that for older students when they were given elaborated instructions containing specific guidelines as to how to form their argument, the students produced much more persuasive samples. The specific instructions included directing the students to include a statement to support their belief, two or three reasons for their belief, examples of supporting information for each reason, two or three reasons as to why others might disagree, and why those reasons are wrong. In this current study, such explicit instructions were not used however some of these were presented by using examples to direct the participants. Three examples were used for and against the topic within the example instruction, indicating what might be expected. As with Ferretti et al. (2000) a model or more specific instruction, led participants to produce more persuasive discourse samples by producing a greater number of reasons to support their claim.

It is also important to consider the role of topic for affecting discourse production measures and in particular persuasiveness elements. The topic of animal welfare is potentially more emotive and controversial than that of environmental issues. The procedures of this research attempted to reduce the impact of animal welfare being a controversial topic, by substituting the terminology of 'controversy' within the instructions, as used in Nippold et al. (2005) study, for that of 'topic'. In addition to this emotional aspect, there is also the frequency of use or exposure to these experiences that may affect ones

opinion. For example, public transport is constantly advertised and observed within towns. Some smaller towns admittedly may not have as great an exposure to this, however most New Zealanders would experience public transport at least once a month if not more, compared to the less frequent exposure to travelling circuses with animals.

4.3 Cognitive Impacts

Cognitive processing difficulties may be additional issues that underpin the more salient language difficulties, for example, difficulties with attention, storage and retrieval of vocabulary and content, and working memory (Baddley, 1998; Chapman et al., 1997; Coelho, 2002; Hartley, 1995; King et al., 2006; Tompkins et al., 1994). It would be of interest to compare the working memory scores of participants to the persuasiveness measures to determine if there was any correlation between variables. For example, one's ability to retain instructions and manipulate examples provided to match one's own experiences, may affect their ability to provide appropriate number of reasons and elaborations of these reasons. In addition to retaining the instructional information, working memory would need to be activated in order to monitor the verbal output previously presented in order to make further links and additions to this information. This revision of material presented is much more readily and easily done with written tasks than that of lengthy verbal productions. There is agreement in the literature that working memory plays a significant role and is an influencing factor on discourse production (Chapman et al., 1997; Coelho, 2002; Tompkins et al., 1994).

Many of the TBI participants are likely to have been involved with rehabilitation programmes and may have even had speech-language therapy input. As a result of this

involvement of specialist professionals, participants may have learnt compensatory strategies that may assist their communication. These persuasive discourse tasks may not have allowed for these compensatory to be implemented as they might otherwise typically initiate them. For example, a number of participants with TBI requested to use a pen and paper in order to write down ideas to assist with organisation and memory difficulties. Due to the nature of this task and the need for each participant to experience the same stimulus, this current research could not take these compensatory strategies into account. This may be of interest to incorporate or identify within future research.

This in turn links in with individuals learning styles. Individuals all learn and process information in unique ways, for example, some people may wish to perform activities in which to process information, others may benefit from seeing the information, whereas others may prefer listening to information (Felder & Silverman, 1988). As some participants requested to be able to write ideas, this may indicate that their learning and processing style is more of a visual mode than relying on processing information in an auditory manner.

4.4 Clinical Implications

The findings from this study can have direct clinical implications in both assessment and intervention settings. This study supports other studies that identify the need to assess a variety of genres when examining expressive language of the brain injured population (Chapman et al., 1997; Davies, 2008; Hay & Moran, 2005). Persuasive discourse needs to be assessed in addition to other genres when developing an assessment battery and in turn a

rehabilitation plan for TBI patients. Persuasion is an important aspect of successful daily living activities and may impact on one's quality of life.

As with any rehabilitation task, practice is paramount to facilitate embedding and automating the targeted skills. Therefore, it is suggested that individuals with TBI be presented with numerous opportunities to practice utilising persuasive language skills and in addition to be provided with relevant feedback in order to modify and enhance these skills. Felton (2004) commented that practice alone was not sufficient to enhance persuasive discourse skills and suggested that a combination of practice and reflection was more beneficial.

In addition to practice, the manner in which persuasion is elicited could be modified in order to facilitate more success from TBI and non-TBI individuals. Opinion presenting strategies, as identified in developmental and learning disability literature such as elaborated goal instructions and direct teaching of what makes a persuasive argument, could benefit both of these population groups (Felton, 2004; Ferretti et al., 2000; Nussbaum, 2005). This could be implemented in work place situations e.g. employers could present examples and direct instructions as to what they are expecting when leading team based discussions and requesting others to present their opinion.

4.5 Limitations of the Study

Whilst this study elicited some interesting results, there were a number of limitations that need to be addressed in order to minimise these effects for potential future reduplications or variations of this study. It is well documented that the heterogeneous nature of both populations makes it difficult to control for unique characteristics, in addition

to this the heterogeneity of the TBI population makes it even more difficult to control with regards to their injury severity and impact (e.g. Chapman et al., 1997; Hay & Moran, 2005). Participants are likely to have sustained their brain injuries in many different ways and at differing stages in development, particularly for those adults who sustained a TBI during childhood or adolescence. It is important to consider the variability of the participants in this current study when attempting to generalise to a larger TBI population.

The sample size was also a limiting factor, even though this was comparable to other discourse studies sample size (Biddle et al., 1996; Cook, 2008; Davies, 2008; Ewing-Cobbs et al., 1998; Hay & Moran, 2005). Other studies had used larger samples sizes, for example Nussbaum (2005) had 224 participants and Nippold et al., (2005) recruited 180 participants, and therefore provided more robust results due to potentially capturing the greater language discrepancies between groups.

4.6 Future Directions

The current study has presented opportunities for future research direction. In future research it would be interesting to take into account Ferretti et al. (2000) approach of using elaborated goals with detailed and specific instructions, and compare this to the methodology employed within this present study. Rather than presenting the same participants with the variation between persuasive tasks, it would be necessary to compare the tasks between groups, so as to not result in modified responses due to multiple opportunities to practice the task.

With regards to pragmatic measures, other measures beyond those used within this study could be investigated, as observational interaction and previous studies indicate that this is the aspect of greatest disparity between groups (Davies, 2008; Snow et al., 1997). Measures such as cohesion and coherence could be addressed, to determine whether participants connect and link their utterances and ideas in a logical manner for a listener to follow.

This study elicited the persuasive language task in a monologic manner, however this is not typically how one would be involved with expressing their opinion. Typically, the communication partner or partners would provide their agreement or disagreement for the claims and reasons presented. Jorgenson & Togher (2009) have found that adults with a TBI performed more successfully on narrative language tasks when involved in a jointly produced discourse compared with a monologic discourse. It would be interesting to compare a jointly produced dialogue compared to a monologue of spoken persuasive discourse, however the means in which to control the variables in the dialogue would need to be well thought out.

Finally, further research investigating methods in which to enhance adults with TBI spoken persuasive skills with the ultimate goal of devising functional and easily applicable strategies would be advantageous.

SUMMARY

Adults with TBI were not found to differ significantly in comparison of language productivity or pragmatic measures. However, they did differ significantly on the language complexity measures of total clauses and independent clauses, producing a greater number for each of these elements compared to their age-matched peers. An important finding of this study is that the use of examples does facilitate more persuasive discourse samples in both TBI and non-TBI populations. The results of this study contribute to the growing evidence that supports the value of elaborated goals. These findings support the implementation of more directive instructions and the use of exemplars to facilitate more persuasive communication. Following on from this study, more investigation would be warranted in this genre and with the TBI population to enhance the pool of literature in this area and further enable evidence based practice.

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APPENDICES

Appendix A: Information Sheets and Consent Forms

College of Science

Shannon Emmerson
Principal Researcher
University of Canterbury
Department of Communication Disorders
Private Bag 4800, Christchurch 8140



RESEARCH PROJECT INFORMATION SHEET FOR PARTICIPANTS

University of Canterbury
Department of Communication Disorders

You are invited to take part in a research project called:

‘Spoken Persuasive Discourse of Adults with Traumatic Brain Injury’

Persuasive discourse is what you use when you want to explain your ideas or opinion to someone so that they agree with you. For example, convincing someone that Hanmer is the best holiday destination, is a kind of persuasive discourse.

What is the study about?

The aim of this project is to look at these skills in adults who have had a head injury. These skills are important to investigate because they are necessary skills required in employment and everyday settings. It is a useful skill to be able to form opinions and to provide good reasons for opinions to encourage others to understand your perspective. Learning more about these skills will help therapists and people who work with adults who have head injuries to better develop treatment programs and better understand their spoken persuasive discourse skills.

You are invited to join in the study as a participant who has had a head injury. There will be another group of adults in the study who have not had a head injury. You will not know who they are, and they will not know who you are but you will do all the same tasks that they will.

What does the study involve?

If you would like to take part in this project, you will be asked to complete the following:

- **Spoken Language Assessment:** Core Language Subtests from the 'Clinical Evaluation of Language Fundamentals 4' (CELF 4). These will take approximately 45 minutes to complete. These brief tasks will include listening and following instructions as well as making up sentences based on pictures.
- **Working Memory (WM) Assessment:** This task will take approximately 10 minutes to complete. This task involves listening to a series of sentence sets and answering simple questions as well as remembering words.
- **Two Spoken Language Samples.** These samples will take approximately 20 minutes to complete. These tasks will involve talking about a particular topic e.g. 'Recycling is a great way to save the planet; Circuses shouldn't be allowed to use animals'

Assessment will occur at your home or at the University of Canterbury Speech and Hearing Clinic over 1 – 2 sessions, with each session being up to an hour (total time will be no longer than 2 hours). There are no foreseeable risks in taking part in the study. You will be given frequent breaks throughout the session. You are welcome to bring a support person with you when taking part in the study.

Prior to starting assessment tasks, the research project will be explained to you and you will be asked to sign a consent form, therefore giving your permission to take part and indicating that you understand what the project involves.

If you wish, you may withdraw from the project at any time, including withdrawal of any information you have already given to the study. Taking part in the study or not taking part will not affect your relationship with the University of Canterbury or any other services you access either now or in the future.

To make sure everything is recorded accurately, tasks will be audio and video taped. These tapes will not be shown or played to anyone other than the researchers and you can have a copy of the tapes at the end of the project. These tapes are kept confidential and stored safely throughout the project and at the end of the project i.e. stored in a locked filing cabinet, only accessible by the participants and researchers.

Who is carrying out the study?

Shannon Emmerson is carrying out this study as part of her Masters of Speech Language

Therapy Degree at the University of Canterbury. Shannon Emmerson is the principal researcher under the supervision of Dr Catherine Moran and Dr Megan McAuliffe.

The results of the project may be published (i.e. in a journal), but participants may be assured of the complete confidentiality of the information gathered in this investigation and that their identity will not be made public without their consent. To ensure no one will recognize you, you will be referred to as a number e.g. 'Participant 2'.

If you would like, you can receive a written summary at the end of the project.

Can I tell other people about the study?

You can tell anyone about the study, including other adults who might be interested in taking part.

What if I need to know more?

Thank you for taking the time to read this information. We look forward to hearing from you. If you have any questions about taking part in the study or want to meet with the researcher before deciding if you want to take part, please contact **Shannon Emmerson** directly on (03) 366 7001 ext. 4263, or send an email to: shannon.emmerson@canterbury.ac.nz and she will be happy to meet with you in person and discuss the study further.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

Kind Regards,

Shannon Emmerson

Speech Language Therapist

Principal Researcher

Research team:**Shannon Emmerson**

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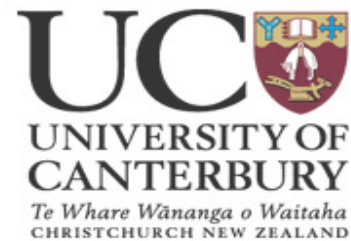
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RESEARCH PROJECT INFORMATION SHEET FOR PARTICIPANTS

University of Canterbury
Department of Communication Disorders

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The aim of this project is to look at these skills in adults who have had a head injury. These skills are important to investigate because they are necessary skills required in employment and everyday settings. It is a useful skill to be able to form opinions and to provide good reasons for opinions to encourage others to understand your perspective. Learning more about these skills will help therapists and people who work with adults who have head injuries to better develop treatment programs and better understand their spoken persuasive discourse skills.

You are invited to join in the study as a participant who has not had a head injury, in order to provide comparative information. There will be another group of adults in the study who have had a head injury. You will not know who they are, and they will not know who you are but you will do all the same tasks that they will.

What does the study involve?

If you would like to take part in this project, you will be asked to complete the following:

- Spoken Language Assessment: Core Language Subtests from the ‘Clinical Evaluation of Language Fundamentals 4’ (CELF 4). These will take approximately 45 minutes to

complete. These brief tasks will include listening and following instructions as well as making up sentences based on pictures.

- **Working Memory (WM) Assessment:** This task will take approximately 10 minutes to complete. This task involves listening to a series of sentence sets and answering simple questions as well as remembering words.
- **Two Spoken Language Samples.** These samples will take approximately 20 minutes to complete. These tasks will involve talking about a particular topic e.g. 'Recycling is a great way to save the planet; Circuses shouldn't be allowed to use animals'

Assessment will occur at your home or at the University of Canterbury Speech and Hearing Clinic over one to two sessions. There are no foreseeable risks in taking part in the study. You will be given frequent breaks throughout the session. You are welcome to bring a support person with you when taking part in the study.

Prior to starting assessment tasks, the research project will be explained to you and you will be asked to sign a consent form, therefore giving your permission to take part and indicating that you understand what the project involves.

If you wish, you may withdraw from the project at any time, including withdrawal of any information you have already given to the study. Taking part in the study or not taking part will not affect your relationship with the University of Canterbury or any other services you access either now or in the future.

To make sure everything is recorded accurately, tasks will be audio and video taped. These tapes will not be shown or played to anyone other than the researchers and you can have a copy of the tapes at the end of the project. These tapes are kept confidential and stored safely throughout the project and at the end of the project i.e. stored in a locked filing cabinet, only accessible by the participants and researchers.

Who is carrying out the study?

Shannon Emmerson is carrying out this study as part of her Masters of Speech Language Therapy Degree at the University of Canterbury. Shannon Emmerson is the principal researcher under the supervision of Dr Catherine Moran and Dr Megan McAuliffe.

The results of the project may be published (i.e. in a journal), but participants may be assured of the complete confidentiality of the information gathered in this investigation and

that their identity will not be made public without their consent. To ensure no one will recognize you, you will be referred to as a number e.g. 'Participant 2'.

If you would like, you can get a written summary at the end of the project.

Can I tell other people about the study?

You can tell anyone about the study, including other adults who might be interested in taking part.

What if I need to know more?

Thank you for taking the time to read this information. We look forward to hearing from you. If you have any questions about taking part in the study or want to meet with the researcher before deciding if you want to take part, please contact **Shannon Emmerson** directly on (03) 366 7001 (Ext. 4263) or send an email to: shannon.emmerson@canterbury.ac.nz and she will be happy to meet with you in person and discuss the study further.

This project has been reviewed and approved by the University of Canterbury Human Ethics Committee.

Kind Regards,

Shannon Emmerson

Speech Language Therapist

Principal Researcher

Research team:**Shannon Emmerson**

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PARTICIPANT CONSENT FORM

‘Spoken Persuasive Discourse of Adults with Traumatic Brain Injury’

I have read or have had read to me the information sheet for the above-named study and understand the description of this. I have been provided with the opportunity to discuss the project with a caregiver, family member or friend. On this basis I agree to participate as a subject in the project and consent to audio and video recordings being made to ensure accurate information is obtained.

I consent to publication of the results of the project with the understanding that anonymity will be preserved e.g. I will be referred to as ‘Participant 2’.

I understand that taking part in this study is voluntary (my choice) and that I may at any time withdraw from the project, including withdrawal of any information I have provided. Taking part in this study or not taking part will not affect my relationship with the University of Canterbury or any other services I access now or in the future.

I have had the chance to talk about this study with the researcher/s. I am happy with the answers I have been given.

- I agree to digital recordings/ video being used for clinical training purposes at the University of Canterbury only. **YES / NO**
- I wish to receive a copy of the results **YES / NO**

I understand that the project has been reviewed and approved by the University of Canterbury Human Ethics committee.

I hereby agree to take part in this study

NAME (please print):

Project Role:

Signature:

Date:

Appendix B: Working Memory Task.

Working Memory Span Task (from Tompkins et al., 1994)

Name: _____

Date: _____

D.O. B: _____

Age: _____

Administration Directions – Each item is preceded by the word “Ready?”

Allow 1 second between the alert and the first stimulus

Allow a 3 second interval between each sentence

Allow 5 seconds between each set

Instructions:

“First listen to these sentences and say “True or False”

Trial: A cow gives juice.

The sky is blue.

“Now I want you to remember the last words of these sentences”

Trial: The milk is cold.

The fruit is in the bowl.

“This time, I want you to tell me whether the sentence is true or false and then, when I raise my finger, tell me the last word in the sentence. Let’s try it”

Trial: Fish can swim.

Winter is hot.

LEVEL 2 SETS – “Now you will hear two sentences

Set 1

Words Remembered:

You sit on a chair ____ (T)

Trains can fly. _____ (F)

Set 2

Words Remembered:

A table is an animal ____ (F)

Children like games _____ (T)

Set 3

Words Remembered:

Tigers live in houses ____ (F)

Milk is white _____ (T)

LEVEL 3 Sets- “Now you will hear three sentences”

Set 4

Words Remembered:

Sugar is sweet. ____ (T)

Auckland is in the South Island _____ (F)

Horses run in the sky. _____ (F)

Set 5

Words Remembered:

You can ride on a bus. _____(T)

Cats can talk _____ (F)

Apples grow on trees _____ (T)

Set 6

Words Remembered:

Pumpkins are purple _____(F)

Mice are smaller than lions _____ (T)

Roses have thorns. _____ (T)

LEVEL 4 SETS – “Now you will hear four sentences”

Set 7

Words Remembered:

Twelve equals one dozen. _____(T)

Bicycles are slower than cars _____ (T)

A book can play. _____ (F)

Feathers can tickle _____(T)

Set 8

Words Remembered:

Water is dry. _____(F)

Cows like to eat grass _____ (T)

Ducks have webbed feet _____ (T)

Little boys wear dresses _____(F)

Set 9

Words Remembered:

Chickens eat eggs. _____(F)

Babies can drive _____ (F)

A clock tells time. _____ (T)

The sky is green _____(F)

LEVEL 5 SETS –“Now you will hear 5 sentences”

Set 10

Words Remembered:

Carrots can dance. _____(F)

Fish swim in water _____ (T)

You sleep on a bed. _____ (T)

You eat breakfast at night _____(F)

People have eyes _____(T)

Set 11

An orange is a fruit. _____(T)

February has 60 days _____ (F)

A shoe has ears. _____ (F)

You wash with soap _____(T)

A car can race _____(T)

Set 12

You keep books in ovens. _____(F)

Rabbits can read _____ (F)

A lobster has a shell. _____ (T)

Chairs can eat _____(F)

Dogs have four legs _____(T)

Appendix C: Instructions for all Elicitation and Topic Variations.

Circus with Examples.

People have different views on animals performing in circuses. For example, some people think it is a **great idea** because it provides lots of entertainment for the public. Also, it gives parents and children something to do together, and the people who train the animals can make some money. However, other people think having animals in circuses is a **bad idea** because the animals are often locked in small cages and are not fed well. They also believe it is cruel to force a dog, tiger, or elephant to perform certain tricks that might be dangerous. I am interested in learning what **you** think about this topic, and whether or not **you** think circuses with trained animals should be allowed to perform for the public. I would like you to spend the next few minutes to tell me in depth exactly what **you** think about this topic. Give me lots of good reasons for your opinion. Take your time to gather your thoughts and then you can start talking about this topic when you are ready. Do you have any questions?

Circus without examples.

People have different views on animals performing in circuses. I am interested in learning what **you** think about this controversy, and whether or not **you** think circuses with trained animals should be allowed to perform for the public. I would like you to spend the next ten minutes telling me exactly what **you** think about this topic. Give me lots of good reasons for your opinion. I will let you know when you have 1 minute to go, and might ask you if you can think of any other reasons for your opinion if you finish early. I will give you a couple of minutes to gather your thoughts and then you can start talking about this topic when you are ready. Do you have any questions?

Public transport with instructions.

People have different views on public transport, like buses or trains. For example, some people think it is a **great idea** to use public transport because it saves money and you don't have to worry about things like parking or driving during busy traffic times. Also, it provides you with an opportunity to meet other people. However, other people think that using public transport is a **bad idea** because it means that you aren't flexible with your time - you have to be at the bus stop at a certain time, and the bus might not be reliable at being on time. If it is wet you have to wait in the cold and rain until the bus arrives. They also believe that it is uncomfortable with too many people crammed in during busy times. I am interested in learning what **you** think about this topic, and whether or not **you** think public transport should be encouraged for everyone to use and your reasons why. I would like you to spend the next few minutes to tell me in depth exactly what **you** think about this topic. Give me lots of good reasons for your opinion. Take your time to gather your thoughts and then you can start talking about this topic when you are ready. Do you have any questions?

Public transport without examples.

People have different views on public transport, like buses or trains. I am interested in learning what **you** think about this topic, and whether or not **you** think public transport should be encouraged for everyone to use and your reasons why. I would like you to spend the next few minutes to tell me in depth exactly what **you** think about this topic. Give me lots of good reasons for your opinion. Take your time to gather your thoughts and then you can start talking about this topic when you are ready. Do you have any questions?

Appendix D: Coding Chart.

Persuasive Discourse Sample Analysis Coding Chart

Please use the examples to guide your analysis and complete the values section for this score chart.

Sample Label:	Descriptor	Code	Example	Values
Language Productivity	mean length of T-unit in words	MLTU-W		
	total words	TW		
	T-units per minute	TU per min		
	% T-units with mazes	%TU with mazes		
Language Complexity	total number of clauses	TC	[indep + dep]	
	clause density	CD	[indep + dep / T-Units]	
	clause type			
	Independent	IC	contains a subject and a verb and expresses a complete thought e.g. [I think]; [I ride the bus regularly]	
	Relative	REL	e.g. I ride [the bus <i>that goes around the malls</i>]	
	nominal	NOM	e.g. I think [<i>that animals should be left in their natural habitat</i>]	
	adverbial	ADV	e.g. [<i>unless we work together</i>], we'll be stuck in this situation.	
	claim	C1, C2	e.g. I like public transport [C1]. I also like private	

			transport [C2].	
	number of reasons	R1, R2	e.g. I like public transport because it is cheap [R1] and interesting [R2].	
	number of elaborations	E1, E2	e.g. I like public transport because it is cheap and interesting. It only costs \$2.20 [R1, E1] and there are lots of different people travelling together [R2, E2].	
	Conclusion Summary Ending	CONC-SUM CONC-END	e.g. So I really think people should use public transport e.g. and that's all I have to say about that.	
	Irrelevancies	IR	e.g. it's really windy outside.	
	Repetitions	REP	e.g. I like public transport because it is cheap [R1 REP]	
	Attitude	FOR AGAINST MIXED		

T-unit = an independent clause with any associated dependent clauses

e.g. I enjoy catching the bus because it is interesting.

Indep = independent clause

Dep = dependent clause

Appendix E: Discourse Samples.

TBI participant -

Circus with examples.

I believe having animals performing in a circus is a bad idea
 I am totally against it
 I belong to SAFE which is save animals from exploitation
 I believe that getting animals to perform is actually exploiting them
 They should be able to live out their lives in the wild {um} like a normal animal
 instead of just being used by humans to make money from and {being} not being
 treated well in the process
 I've heard lots of stories about animals treated badly
 {Um} it's not {it's} just that they are locked in small cages and not fed well
 {Sometimes they're um} sometimes they're {um} hit when they don't do what the
 people want
 and {um} they don't get enough affection as they would if they were someone's pet or
 whatever
 {Um um} they're not allowed to fall in love and breed as they would in nature and
 stuff and {um} eat natural foods and live a natural life
 and I {I} don't think it's good
 The transportation wouldn't be very {um} amenable {to a} to a human being
 Being in a vehicle travelling it's just something totally foreign to them which they
 would never and to love even if they did get treats and did get affection
 There's a lot of things that go on {um} in that environment where I just feel that
 animals are kind of being used and should really be free
 {Um} I think that even though you've given those {um} topics of it being a great idea
 I think that there are lots of other entertainment that childrens and parents can find
 that don't involve using live animals which are usually wild animals that should be in
 the wild
 And cats and dogs are domesticated
 but most animals they use like {um} elephants and tigers and bears and things {um}
 should actually be living out their lives in the wild
 And I {I} often think maybe there isn't enough money in a circus {um for} to provide
 good vet treatment and stuff like that
 so they end up suffering a lot more if they end up with something wrong with them
 than they would have {Um if they if they for example [6 sec pause]} because they
 might have only got those things wrong with them because they're living in a {um}
 manmade environment rather than a wild environment
 [12 sec pause] I just think that animals should be free [5 sec pause] and not used to
 make money for us
 And I think we can have other entertainment like {um you know} circuses with the
 trapeze artists and things which are very entertaining
 They're humans who have chosen to do that
 They've got a choice
 whereas animals don't have a choice
 And the people who train the animals can make money a different way {so I think that
 you know}
 I just don't like the way they are caged and transported and fed and disciplined
 That's why I don't think they should be encouraged

Public transport without examples.

{ok well} I have lots of fors and against {um} but mainly pros
 {um} I think people should be encouraged to use public transport because {it saves} it cuts down emissions in the environment
 {It Um} it's a better use of resources rather than people alone in a car to actually use the same amount of petrol to {um} go on a bus or a train
 {um} And plus it saves {saves} each driver money
 {um} But {you could also} they could also justify that by saying {oh} we can do car pooling or we can cycle or whatever] {um}
 So there are other options
 but {um} I think trying to use public transport as much as possible is really good unless you have to carry lots of heavy things or go on lots of little routes][that the bus doesn't go on or the train
 But I think {it's} it's a positive thing for the environment
 I think we should be doing more of
 {Um yes it's mainly um} the biggest ones for are for the environment and to save money
 {Um} that's it

Non-TBI participant -

Public transport with examples.

I have very strong opinions of public transport
 I travelled on public transport in my last position for {um oh} about 4 years
 I travelled for two and a half hours a day on public transport
 {Um} the main reason was because to be able to afford a house in Melbourne you
 needed to live way out
 And we actually purchased a house on the public transport line so that I could
 commute every day]
 The benefit of public transport is that it keeps cars off the road
 And it's a quick and easy way to work
 But it is often poorly run and poorly managed
 When things go wrong which they often do {um} people get stranded
 {Um} and {it's yeah} it can actually be very very crowded
 Fortunately we lived so far out that I always got a seat
 But ten minutes from where I lived people had to stand for forty minutes on a trip
 So {it} it actually has its benefits
 But it has to be managed well
 And it has to be cost effective to encourage people to actually use it

Circus without examples.

Animals should be used in circuses as long as they are well looked after {um} and
 the people have the best interest of the animals at heart rather than just as process
 of making money
 {Um} I think the good purpose for animals being in circuses is that a lot of people
 particularly children don't have access to live animals
 {Um} and as long as they see animals being treated well I think it is a very exciting
 and good experience for kids to be able to access animals at that level
 {Um} that's it